

# Is There Any Difference Between Matriculation Students and Community College Students in Adjusting to Engineering Departments of Universities in Hong Kong?

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## Abstract

There are two ways to enter the universities in Hong Kong. One of them is from the completion of secondary school while the other way is from the completion of community college. Both types of students come across the academic, social and psychological adjustments when admitted by the engineering departments of universities in Hong Kong. The study is based on a survey on 456 engineering fresh students when they have just entered the universities. The purpose of this study is to examine the difference between the two groups of students from the five local universities. The findings show that (i) students from matriculation can adjust academically better than the students from the community colleges; (ii) students from matriculation can adjust socially better than the students from the community colleges; and (iii) students from matriculation can adjust psychologically better than the students from the community colleges.

## Keywords

*Community College; Engineering; Hong Kong; Matriculation*

## Introduction

Traditionally, students who have completed secondary schools can enter universities if their academic results fulfill the university entrance requirements in Hong Kong. However, due to the limited and competitive places in the local universities, so outstanding students can directly enter universities when they have finished their secondary school education. Yet, this does not mean that those students need to stop promoting for higher education. Community college can act as a gateway for those students to enter universities (Vaughan, 1987). Nevertheless those students receiving a 2-year liberal arts education still face many difficulties in entering

universities in adjusting to the studies in the universities (Harrison, 1999) due to the significant differences between the cultures of community college and the universities (Harrison, 1999). Wintre et al. (Wintre, 2009) have mentioned that there are three types of adjustments (academic, social and psychology) to universities. However, it appears that no studies have been done to examine the difference between the community college students and matriculation students in adjusting to engineering departments of universities in Hong Kong. The purpose of this study is to fill this gap by asking those engineering students to answer the research questions as given below:

1. Do students transitioning in a traditional way, (i.e. directly entering the universities after completing matriculation) adjust academically to the university better than students transitioning from community colleges?
2. Do students transitioning in a traditional way (i.e. directly entering the universities after completing matriculation) adjust socially to the university better than students transitioning from community colleges?
3. Do students transitioning in a traditional way (i.e. directly entering the universities after completing matriculation) adjust psychologically to the university better than students transitioning from community colleges?

## Literature Review

In Hong Kong, students can enter the universities through different channels. Traditionally students

who have completed matriculation and have taken the advanced level examination to meet department entrance requirements can enter the universities. Besides, community college is another common channel for students to enter the universities. It is believed that students with different high school's background have different adaptation when entering the universities. Hence, they have different perception towards the support and the structures provided by the universities. Students have received 2 or 3 years' associate degree education before transitioning to the universities. Both Universities Matriculation Examination (UME) and associate degree (AD) are used as modes of admission into Universities. Associate degree should not be seen as inferior to the UME, since they have met the same entry requirements (Omirin, 2007). The students meeting with UME show higher self-esteem, significant increases in self-report measures of internal locus of control, and higher levels of academic performance and motivation than those meeting with AD (Hoffman, 2005).

Modern community colleges have comprehensive missions, performing numerous functions from vocational education to community service education (Cohen, 1996), however, they are still committed to their original mission of preparing students for transitioning to universities. Yet, successful completion of the intermediate outcome (the associate degree) in the community colleges does not mean they are well prepared for adapting to and adjust well to the universities. Many studies have reported that students who transitioning from community colleges to universities encounter difficulty in adjusting themselves to universities in both academic and social culture. All these adjustment difficulties may result in a decline in academic performance (Hills, 1965).

In addition, previous studies have indicated that students from the community colleges, are not always well prepared academically (NCES, 1998), which makes them lag behind other matriculation students. Thus this leads to the situation that students from matriculation have better academic performance than those from community colleges.

Moreover, Terenzini et al. (Terenzini, 1996) pointed out that friends from the past could confound the transition process of the fresh students. Terenzini et al. (Terenzini, 1996) also indicated that friends from community colleges often complicate the transition process by anchoring students to old networks of friends and pattern of behaviors rather than allowing them to explore and adapt the new social environment

in the universities. Therefore, students who from community colleges find it more difficult to adjust the new environment and get along with students' from matriculation.

Besides, Hispanic students who transition into community colleges may have difficulty in adjusting to universities academically and socially because they don't share the cultural knowledge of Caucasian, non-Hispanics (Keim, 2010). However, all students successfully transitioned from the community college into university if they participated in reflective discourse within large and small groups during the six-week summer program (Keim, 2010).

Furthermore, students transitioned to universities from different channels, such as after completing their matriculation or the community colleges, would adjust differently as the culture of their previous schools or institutions were quite distinct (Townsend, 1993). Past studies have shown that students from matriculation can adjust academically better than the students from the community colleges [(Dougherty, 1992), (Townsend, 1993)]. Moreover, Terenzini et al (Terenzini, 1996) and Holahan and Moos (Holahan & Moos, 1981) suggested that students from matriculation can adjust socially better than the students from the community colleges. In addition, Brown & Harris (Brown, 1978) found that students from matriculation can adjust psychologically better than the students from the community colleges.

Based on the above evidence, we hypothesize:

H1: Students from matriculation can adjust academically better than the students from the community colleges in Hong Kong.

H2: Students from matriculation can adjust socially better than the students from the community colleges in Hong Kong.

H3: Students from matriculation can adjust psychologically better than the students from the community colleges in Hong Kong.

## Research Method

### *Constructs Measure and Questionnaire Design*

In this study, we have utilized quantitative survey based data of students to test the hypotheses stated above because the quantitative survey data can be used to conduct bivariate analysis to test three hypotheses (Babbie, 1990).

The Student Perception of University Support and Structure (SPUSS) scale (Wintre, 2009) was used in the

TABLE 1 ITEMS IN THE THREE CONSTRUCTS

Question	Items
	<b>Academic adjustment (1 – 5 scale from strongly disagree to strongly agree)</b>
2	The degree and programme requirements in the university calendar are very clear.
4	Professors in classes make it clear what students are expected to do in order to get a good grade on assignments, papers and tests.
8	There are lots of confusing rules that make registration and course selection difficult.
10	If students are having difficulties with their academic coursework, they can easily talk to professors or their teaching assistants.
11	Professors at this school don't really try to make you think.
12	Professors get tests and assignments back to students in good time.
13	It is hard for students to get advice in selecting courses or deciding on a programme of study.
15	Academic policies on cheating and copying are made clear to students.
16	Professors and teaching assistants don't give very much feedback on tests, exams or papers.
19	Professors emphasise reasoned questions and critical appraisal of what they present in class.
	<b>Social adjustment (1 – 5 scale from strongly disagree to strongly agree)</b>
3	It's easy to make friends.
17	There's very little opportunity for students to have direct, one-to-one contact with a professor.
18	Other students in my programme are supportive and friendly.
20	Faculty and teaching assistants post office hours and are available when they say they will be.
	<b>Psychological adjustment (1 – 5 scale from strongly disagree to strongly agree)</b>
1	Students are informed during student orientation about help available to them if they are having any emotional or adjustment problems.
5	If a student needed help for an emotional problem, it would be easy to find a service on campus to help them.
6	Professors aren't really clear about what they expect of students.
7	A student can feel pretty anonymous in the programme.
9	The professors don't really care about their students.
14	Professors and teaching assistants in classes are helpful and encouraging.
21	School officials and advisers are approachable and open-minded when you have a question or problem.

questionnaire. There were 21 items as shown in TABLE 1 for three dependent variables in the questionnaire: namely, academic (Q2, Q4, Q8, Q10, Q11, Q12, Q13, Q15, Q16 and Q19), social (Q3, Q17, Q18 and Q20) and psychological (Q1, Q5, Q6, Q7, Q9, Q14 and Q21). The questions are randomly placed to avoid common method variance (CMV). Five-point Likert-type scales were assigned to all items. These items were anchored at (5) strongly agree; (4) agree; (3) neutral; (2) disagree and (1) strongly disagree.

### Survey and Student Profile

In Hong Kong, the matriculation students enter the engineering programmes in the first year, while the community college students have access to the same programmes directly in the second year. The actual survey was conducted by distributing of questionnaires to the respondents during the lectures. The questionnaire was completed within 10 minutes. 500 questionnaires were distributed to 500 fresh students (matriculation) and sophomores (community college) of engineering department at the end of their first semester from five universities. Totally 456 questionnaires were received with a return rate of 91.2%. The usability rate was 100% as no incomplete questionnaires were found.

Descriptive statistics were used to analyze the demographic data on respondents. TABLE 2 displays the demographic data on respondents in which 258 males and 198 females were selected for the study. 68% of respondents were studying in full time, 29.8% in part time and 2.2% in exchange scheme. 68% of respondents have completed the matriculation while the rest of them have completed associate degree or higher diploma.

TABLE 2 STATISTICS OF THE PERSONAL DATA OF RESPONDENTS

Personal Details	No. of respondents	Percentage of respondents (%)
<b>Gender</b>		
Male	258	56.6
Female	198	43.4
<b>Study mode</b>		
Full time	310	68
Part time	136	29.8
Exchange	10	2.2
<b>Transition channel</b>		
Matriculation	310	68
Community college	146	32

### Validity and Reliability Tests

The data was subject to analysis using SPSS Version 15. Univariate analysis including frequency distribution was used to analyze the personal data of respondents. Following this, bivariate analysis including t-test was used to test the three hypotheses.

Prior to bivariate analysis, data was examined to ensure that it was amenable to the use of these techniques. This involved examining the responses to each question for invalid responses and missing values. Then reliability analysis including Cronbach alpha, was used to test the reliability of the variables. The Cronbach alpha values of academic, social and psychological adjustments were 0.803, 0.715, and 0.827 respectively. Normally, the alpha value should be greater than 0.7 for well established measures (Nunnally, 1978). As no alpha value in this survey study was less than 0.7, the results were considered to be consistent and reliable.

In addition to Cronbach alpha, a factor analysis using varimax rotation was also performed as it typically produced an orthogonal set of interpreTABLE dimensions [(Kaiser, 1965), (McDermeit, 2000)]. The factors with eigenvalues larger than 1 should be retained because an eigenvalue less than 1 implies the scores on the component would have negative reliability [(Cliff, 1988), (Kaiser, 1960), (Zwick, 1986)]. Factor loadings less than 0.3 were omitted as it is accepted that only factor loadings on the attributes greater than 0.3 were suitable for interpretation [(Comrey, 1973), (Li, C., 2007)].

Firstly, to verify that 10 items of academic adjustment could be aggregated into a single measure, a factor analysis for the 10 items was conducted and all items loaded on a single factor was found; i.e., all factor loadings were greater than 0.3 and only one factor had an eigenvalue greater than 1. This single factor accounted for 57.311% of total variance; factor loadings ranged from 0.506 to 0.817.

Secondly, to verify that 4 items of social adjustment could be aggregated into a single measure, a factor analysis for the 4 items was conducted and all items loaded on a single factor was found; i.e., all factor loadings were greater than 0.3 and only one factor had an eigenvalue greater than 1. This single factor accounted for 51.567% of total variance; factor loadings ranged from 0.519 to 0.765.

Lastly, to verify that 7 items of psychological adjustment could be aggregated into a single measure,

a factor analysis for the 7 items was conducted and all items loaded on a single factor was found; i.e., all factor loadings were greater than 0.3 and only one factor had an eigenvalue greater than 1. This single factor accounted for 60.145% of total variance; factor loadings ranged from 0.634 to 0.778.

### Results

Bivariate analysis including t-test was then used to compare the differences between matriculation students and community college students in adjusting to engineering department of universities. The figures of means, standard deviations and t-test were shown in TABLE 3.

*Hypothesis 1: Students from matriculation can adjust academically better than the students from the community colleges in Hong Kong.*

This hypothesis was supported because there was significant difference between matriculation and community college students ( $t = 8.786$ ,  $p < 0.001$ ). From TABLE 3, the two mean scores (matriculation = 3.513, community college = 2.745) suggested that both matriculation and community college students could adjust properly to engineering departments of the universities academically. However, matriculation students could adjust academically to university better than that of community college students.

*Hypothesis 2: Students from matriculation can adjust socially better than the students from the community colleges in Hong Kong.*

This hypothesis was supported because there was significant difference between matriculation and community college students ( $t = 7.876$ ,  $p < 0.001$ ). From TABLE 3, the two mean scores (matriculation = 3.504, community college = 2.982) suggested that both matriculation and community college students could adjust properly to engineering department of the universities socially. However, matriculation students could adjust better socially than that of community college students.

*Hypothesis 3: Students from matriculation can adjust psychologically better than the students from the community colleges in Hong Kong.*

This hypothesis was supported because there was significant difference between matriculation and community college students ( $t = 8.367$ ,  $p < 0.001$ ). From TABLE 3, the two mean scores (matriculation = 3.312, community college = 2.712) suggested that both

matriculation and community college students could adjust properly to the university psychologically. However, matriculation students could adjust better psychologically than that of community college students.

TABLE 3 MEAN, STANDARD DEVIATION AND T-TEST FIGURES OF THREE DEPENDENT VARIABLES

Items	Mean (Standard Deviation)				Mean  Diff.	t	df	Sig.
	Matriculation  (N = 310)		Community College  (N = 146)					
Academic	3.513	0.515	2.745	0.623	0.768	8.786**	454	0.000
Social	3.504	0.608	2.982	0.649	0.522	7.876**	454	0.000
Psychological	3.312	0.650	2.712	0.556	0.600	8.367**	454	0.000
t-test is significant at **p<0.001 level (2-tailed)								

t-test is significant at \*\*p<0.001 level (2-tailed)

## Discussions

The findings show that students transitioning to engineering departments of universities from different channels, such as after completing their secondary schools or transitioning from the community colleges, would adjust differently as the culture of their previous schools or institutions were quite distinct (Townsend, 1993).

The results showed that students who entered the engineering department of the universities after completing matriculation studies have adapted better when handling their academic matter. This finding is supported by Townsend et al (Townsend, 1993) and Dougherty (Dougherty, 1992). Those findings was similar to a past study which showed that transitioning from community college, such as community college in Hong Kong, students were usually less academically prepared and found more difficulties in adjusting themselves to the study in the universities (NCES, 1998). When comparing with students transitioning from matriculation, those transitioning from community college have been taught or have mastered the required fundamental skill, which was needed to succeed in the universities' courses (Townsend, 1993). In contrast, matriculation students who entered universities were academically prepared with most of the necessary basic knowledge, such as pure mathematics, physics, etc. Another study also showed the same result, Dougherty (Dougherty,

1992) suggested that students from community colleges would encounter academic integration and thus more adjustment problem due to poor academic preparation, while matriculation students did better preparation in secondary schools and have less academic adjustment problems.

The findings also showed that students from matriculation and community college have various feelings about the social support in the universities. This finding is supported by Terenzini et al (Terenzini, 1996). In terms of their social adjustment, Terenzini et al. (Terenzini, 1996) also showed that community colleges' students did not adapt well during their transition to the universities. They also showed that the social transition processes of those students from some community colleges were more easily confounded by their friends in the community colleges than students who from matriculation. Terenzini et al. (Terenzini, 1996) also mentioned that students from community colleges' social network in the universities would be anchored by their old networks of friends. They would be anchored to the old pattern of behaviors rather than allowing them to explore and adapt the new social network system in the universities. In contrast, matriculation students were willing to make and form new social networks. Students from the community college in Hong Kong would encounter more psychological adjustment problems when compared with students' from matriculation (Holahan & Moos, 1981). Holahan & Moos (Holahan & Moos, 1981) also pointed out that social support was a very important element for coping with stress and depression at the beginning of studies in universities. Therefore, students who from community college would find more difficulty in establishing their social networks in the university and receive less supports from peer, and they would be more anxious when adapting to the new environment. Thus, the finding also shows that matriculation students could adjust psychologically better than students from community college. This finding is also supported by Brown & Harris (Brown, 1978). Brown & Harris (Brown, 1978) also showed that the feelings of loneliness and isolation of the community colleges' students were stronger than matriculation students, so students who from community colleges would be particularly vulnerable to depression. Therefore, students who from matriculation would adjust psychologically better than students who transitioned from community college.

There are several practical implications stated below:

Firstly, there are negative influences on community college students' retention in a cohort of undergraduate students if the community college students' academic, social and psychological adjustments could not be improved properly. Secondly, the poor control of the three mentioned adjustments can imply that student counseling and the quality of teaching may not be maintained properly in the universities. Thirdly, there are negative influences on the student progresses and achievements in the long run, especially for community college students.

## Conclusions

It is concluded that (i) students from matriculation to engineering departments of universities can adjust academically better than the students transitioned from the community colleges; (ii) students from matriculation to engineering departments of universities can adjust socially better than the students from the community colleges; and (iii) students from matriculation to engineering departments of universities can adjust psychologically better than the students from the community colleges.

The major limitations of this study were the small sample size and only the survey technique was used. In the future study, qualitative technique such as interview should be used to explore the reasons why matriculation students could adjust to engineering departments of universities better than community college students academically, socially and psychologically.

The implication of this study is that the top management of the university should know the significance of the differences between matriculation and community college students among three adjustments. Then those management should know how to revise their university strategies to help community college students improve their academic, social and psychological adjustments.

## REFERENCES

- Babbie, E. *Survey Research Methods*, (2nd Ed.). CA: Wadsworth Publishing Company (1990).
- Brown, G. W. & Harris, T. *Social origins of depression: A study of psychological disorder in women*. New York: Free Press (1978).
- Cliff, N. The Eigenvalues-Greater-Than-One Rule and the Reliability of Components. *Psychological Bulletin*, 103(2), 276 – 279 (1988).
- Cohen, A. M., & Brawer, F. B. *The American community college* (3rd ed.). San Francisco: Jossey-Bass Publishers (1996).
- Comrey, A.L. *A first course in factor analysis*. New York: Academic Press (1973).
- Dougherty, K. Community colleges and baccalaureate attainment. *Journal of Higher Education*, Vol.63, Iss.2, pp.188-214 (1992).
- Harrison, P. L. *Transition experience of Community College transfer students: A qualitative study*. Unpublished doctoral dissertation, University of Virginia, Charlottesville (1999).
- Hills, J. R. Transfer shock: The academic performance of the junior college transfer. *The Journal of Experimental Education*, 33(3), pp.201-215 (1965).
- Hoffman, A.J. and Wallach, J. Effects of mentoring on community college students in transition to university. *The Community College Enterprise*, 11(1), 67-78 (2005).
- Holahan & Moos. Social support and psychological distress: longitudinal analysis. *Journal of Abnormal Psychology*, 90, pp.365-370 (1981).
- Kaiser, H.F. The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20, 141 – 151 (1960).
- Kaiser, H.F., & Coffrey, J. Alpha factor analysis. *Psychometrika*, 30, 1-14 (1965).
- Keim, J., McDermott, J.C. & Gerard, M.R. A community college bridge program: utilizing a group format to promote transitions for Hispanic students. *Community College Journal of Research and Practice*, 34, 769-783 (2010).
- Li, C., & Ford, E. S. Is There a Single Underlying Factor for the Metabolic Syndrome in Adolescents? *Diabetes Care*, 30(6), 1556-1561 (2007).
- McDermeit, M., Funk, R., Foss, M., & Dennis, M. *Exploratory Factor Analysis with alpha method and varimax rotation. LI Analysis Training Series*. Retrieved on 5 April 2011 from: [http://www.chestnut.org/LI/downloads/training\\_memo\\_s/factor\\_analysis.pdf](http://www.chestnut.org/LI/downloads/training_memo_s/factor_analysis.pdf) (2000).
- National Center for Education Statistics (NCES). *Descriptive summary of 1995–96 beginning postsecondary students, with profiles of students entering 2- and 4-year institutions*. Report prepared by L. K. Kojaku, A.-M. Nunez, & A. G. Malizio. NCES 1999-030. Washington, DC: U.S. Department of Education (1998).
- Nunnally J. *Psychometric Theory*. New York: McGraw-Hill (1978).
- Omiring, M.S. Gender issue in the performance of students admitted through UME and pre-degree into the

- Nigerian Universities. Educational Research and Review, 2(3), 046-048 (2007).
- Terenzini, P., et al. "Making the transition to college." Teaching on solid ground: Using Scholarship to improve practice, edited by Robert Menges, Maryellen Weimer, and Associates. San Francisco, CA: Jossey-Bass publishers (1996).
- Townsend, B.K., McNerny, N. & Arnold, A. Will this community college transfer student succeed? Factors affecting transfer students performance. Community College Journal of Research and Practice, 17(5), pp.433-443 (1993).
- Vaughan, G. B. & Templin, R.G. Value added: Measuring the community college's effectiveness. The Review of Higher Education, 10(3), pp.235-245 (1987).
- Wintre, M.G., Gates, S. K. E., Pancer, W. M., Pratt, M. S., Polivy, J., Birnie-Lefcovitch, S., & Adams, G. The Student Perception of University Support and Structure Scale: development and validation. Journal of Youth Studies, 12(3), 289 –306 (2009).
- Zwick, W.R., & Velicer, W.F. Comparison of Five Rules for Determining the Number of Components to Retain. Psychological Bulletin, 99(3), 432 – 442 (1986).

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